

Interactive comment on “Impact of aerosols and clouds on decadal trends in all-sky solar radiation over the Netherlands (1966–2015)” by Reinout Reinout et al.

Anonymous Referee #1

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Review of the manuscript: “Impact of aerosols and clouds on decadal trends in all-sky solar radiation over the Netherland (1966-2015)” by Boers et al. The authors made a good work in analyzing 50-year hourly dataset of global radiation, cloudiness and visibility over the Netherland in order to quantify the contribution of aerosols and clouds to trends in all-sky radiation. They show that all trends in fractional cloudiness, clear-sky and cloud-base radiation contribute significantly to the observed trend in all-sky radiation. I suggest to consider this paper for publication after the following issues are addressed: Specific comments: - Le length of the manuscript could be reduced (especially sections where the methods are described). In this way it will be easier to read the paper and to follow the discussion. - Line 121: the authors write that all-sky

C1

radiation is a function of three components: clear-sky radiation, cloud-base radiation and fractional cloudiness. How do you think that the results could change considering also the type of clouds and not only their extent? - Line 262: the right hand side of the equation has four components. Only three of them are discussed (lines: 264-269). At line 269, the authors write that the fourth term is not shown. Clarify this point. - Line 325: How are estimated the last two parameters used for model calculations? - Line 430: How does the present weather sensor work? Why does the change from human observations to automatic sensor introduce a break in cloudiness series and not in visibility series? - Lines 568-570: How do you explain this result? Technical corrections: - Check the reference at line 77; - Line 105: It is the first time that the abbreviation ACI is used in the text so it is necessary to define it (even if it is already defined in the abstract); - Line 226: Define all the parameters in equation 16; - Some additional references are necessary, for example at lines: 298, 303, 315, 323, 350; - Check the reference at lines 584 and 676.

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2017-88, 2017.

C2